

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A motor driving device comprised of a motor and a digital control means which at least has a current command value calculating means, a current control means and a PWM control means PWM-controlling a motor driving circuit for supplying a current to said motor as its components, and said components of said digital control means are connected in order of said current command value calculating means, said current control means, said PWM control means,

said motor driving device is characterized in that an n-th-order hold means (n is a natural number) is provided between said components of said digital control means whose sampling periods are different from each other,

said n-th-order hold means is a hold means using a n-th-order equation or a hold means that allows an error to fit a n-th-order equation by least squares method so as to be minimum.

2. (currently amended): A The motor driving device according to Claim 1, wherein said n-th-order hold means is provided between said current command value calculating means and said current control means.

3. (currently amended): A The motor driving device according to Claim 1 ~~or 2~~, wherein said n-th-order hold means is provided between said current control means and said PWM control means.

4. (currently amended): A ~~The~~ motor driving device according to ~~any one of Claims 1 to 3~~ Claim 1, wherein said n-th-order hold means ~~is any one of:~~

- a hold means using a n-th-order equation;
- a hold means that allows an error to fit a n-th-order equation by least squares method so as to be minimum;
- a first-order hold means in which $G(s) = T^{-1} \cdot (1+Ts) [(1-\exp(-Ts))/(Ts)]^2$ (where, T is a sampling period) is used as a transfer function; and
- a first-order hold means in which $u(t) = u(k) + [(t-kTs)/Ts] \cdot (u(k+1) - u(k))$ (where, $kTs \leq t < (k+1)Ts$ holds, and Ts is a sampling period) is used as a transfer function provided between said current command value calculating means and said current control means, and said n-th-order hold means is also provided between said current control means and said PWM control means.

5. (currently amended): A ~~The~~ motor driving device according to ~~any one of Claims 1 to 4~~ Claim 1, wherein a microcomputer is used as said digital control means.

6. (currently amended): A ~~The~~ motor driving device according to ~~any one of Claims 1 to 5~~ Claim 1, wherein an inductance value of a winding wire of said motor is 100 μ H or less.

7. (currently amended): A ~~The~~ motor driving device according to ~~any one of Claims 1 to 6~~ Claim 1, wherein said motor is a brushless DC motor.

8. (currently amended): A ~~The~~ motor driving device according to ~~any one of Claims 1 to 7~~ Claim 1, wherein an energizing current of said motor is a rectangular wave current.

9. (original): An electric power steering apparatus comprised of said motor driving device according to any one of Claims 1 to 8.

10. (new): A motor driving device comprised of a motor and a digital control means which at least has a current command value calculating means, a current control means and a PWM control means PWM-controlling a motor driving circuit for supplying a current to said motor as its components, and said components of said digital control means are connected in order of said current command value calculating means, said current control means, said PWM control means,

said motor driving device is characterized in that

a first-order hold means is provided between said components of said digital control means whose sampling period are different from each other,

said first-order hold means is a first-order hold means in which $G(s) = T^{-1} \cdot (1+T \cdot s) [(1 - \exp(-T \cdot s)) / (T \cdot s)]^2$ (where, T is a sampling period) is used as a transfer function or

a first-order hold means in which $u(t) = u(k) + [(t-k \cdot T_s) / T_s] (u(k+1) - u(k))$ (where, $k \cdot T_s < t < (k+1) \cdot T_s$ holds, and T_s is a sampling period) is used as a transfer function.

11. (new): The motor driving device according to Claim 10, wherein said first-order hold means is provided between said current command value calculating means and said current control means.

12. (new): The motor driving device according to Claim 10, wherein said first-order hold means is provided between said current control means and said PWM control means.

13. (new): The motor driving device according to Claim 10, wherein said first-order hold means is provided between said current command value calculating means and said current control means, and said first-order hold means is also provided between said current control means and said PWM control means.

14. (new): The motor driving device according to Claim 10, wherein a microcomputer is used as said digital control means.

15. (new): The motor driving device according to Claim 10, wherein an inductance value of a winding wire of said motor is 100 μ H or less.

16. (new): The motor driving device according to Claim 10, wherein said motor is a brushless DC motor.

17. (new): The motor driving device according to Claim 10, wherein an energizing current of said motor is a rectangular wave current.

18. (new): An electric power steering apparatus comprised of said motor driving device according to any one of Claims 10 to 17.